



Iowa Department of Natural Resources
Flood Plain Management Program

FPID# _____

**Applying for a Flood Plain Permit
Commercial, Industrial, and Multi-Unit Residential
Development and Placement of Associated Fill**

To obtain a DNR Flood Plain Permit for your project, you must submit to this Department the following checklist and the supporting documentation itemized on this checklist. **Applications submitted without this information will be considered incomplete and will not be reviewed.**

- ☐ Completed DNR Form 1031 – “Determining if a Flood Plain Permit is Required – Buildings and Placement of Associated Fill”.
- ☐ Completed DNR Form 1030 – “Pre-Application Confirmation of Flood Plain Construction Parameters”
- ☐ Completed and signed DNR Form 36, *Joint Application Form – Protecting Iowa Waters*.
- ☐ Completed document - "Gaining Approval for Commercial, Industrial and Multi-Unit Residential Developments and Associated Fill" (attached) including the Flood Protection Method Checklist: Buildings and Houses
- ☐ Two sets of engineering plans for the project. Please note that the plans must be prepared and certified by a professional engineer licensed in the State of Iowa.
- ☐ Completed and signed certification stating that the engineering calculations and analysis, if applicable, were prepared by a professional engineer licensed in the State of Iowa.
- ☐ A basic floor plan of the structure(s) showing the outside dimensions of the structure. Make sure to include front, back, and side views of the structure with dimensions.
- ☐ Anchorage description or detail for flood protection method for an LP tanks, if part of the proposal
- ☐ Flood maps published by the Federal Emergency Management Agency (if available for the site), with your location delineated.

Reviewer's Notes:

Gaining Approval for Commercial, Industrial, or Other Residential Development and Placement of Associated Fill

Date: _____
Completed By: _____

1. Application: Completed and signed Joint Application Form Submitted (required)? ☐ Yes ☐ No

Please indicate if the project site is within the incorporated limits of a city by using the word 'in' when listing the city in Item 7 of the application. The application can be found online at the following link.
<http://floodplain.iowadnr.gov/>

A copy of the application and supporting documentation must be sent to:

- Iowa DNR, Flood Plain Permit Program
- Iowa DNR, Sovereign Lands (Submit with the copy for the Flood Plain Management Program)
- U.S. Army Corps of Engineers (Submit to the address listed in the instructions)

Applicant Name:					
Location (in Quarter-Section-Tier-Range format):	Qtr.	Sec.	T	N	R
County:		Stream(s):			

2. Engineering Plans: Two sets of certified plans submitted? ☐ Yes ☐ No

Note: A pre-application consultation with the Iowa DNR to discuss the level of design necessary for your project can be scheduled by calling (866) 849-0321.

The engineering plans must be at a suitable scale for the features that they are portraying and printed on paper no smaller than 11" x 17". The plans must include the project name, the engineer's address and phone number, a north arrow, a bar scale, a legend for symbols and abbreviations, and a revision box. Technical plan information should include, but is not limited to, the following information.

- ☐ Location map (Quad Maps Available at <http://ortho.gis.iastate.edu/>)
- ☐ A site plan showing the proposed project, work limits, the stream, property lines and ownership, borrow sites (if on the flood plain), roads, buildings and any other pertinent physical features.
- ☐ Construction specifications, when applicable.
- ☐ Benchmark descriptions. Provide reference source of datum (National Geodetic Vertical Datum of 1929 or North American Vertical Datum of 1988 or other datum) and describe benchmark location.
- ☐ If using 'other' datum the please explain: _____
- ☐ Additional engineering plan requirements if construction is proposed within the floodway:
 - At least one stream valley cross-section taken perpendicular to the direction of flow through the project area representing typical. The cross section shall extend past the intersection of the proposed improvements and the natural ground. The stream bank protective device(s) should be depicted on the cross-section. Additional cross sections may be required depending on the lineal extent of the project and whether there are natural or artificial control sections on the flood plain. **Note:** A pre-application consultation with the Iowa DNR can be scheduled where, among other items, the number and location of the required stream valley cross sections can be determined.
 - Table(s) of stream valley cross section coordinates (distance – elevation)
 - A stream slope based on a minimum of two survey shots taken at least 500-feet apart

3. Hydraulics & Hydrology:

1. Is any construction proposed to be in the floodway (within the floodway limits)? ☐ Yes ☐ No

(Reference completed DNR Form 542-1030 – “Pre-Application Confirmation of Flood Plain Construction Parameters”)

- If No, skip to Section 4.
- If yes, OR if the Flood Plain Construction Parameters have not been confirmed for this location, please proceed below:

Does the community have a detailed Flood Insurance Study (FIS)? ☐ Yes ☐ No (If “Yes” continue with Section 3.a. If “No”, Skip to Section 3.b, for the situation where No Detailed FIS exists for the Stream)

a. Detailed FIS Exists for This Stream

Does study include detailed information (floodway and 100 yr. flood) information for this stream?

☐ Yes ☐ No (If “No”, Skip to Section 3.b, for the situation where no detailed FIS exists for the stream).

If the proposed project is located within the floodway as delineated in the FIS, it will be necessary to provide hydraulic modeling showing that the project will not cause a rise (0.00 feet) in the 100-year flood elevation. To that end, you will have to follow the steps below for hydraulic modeling.

Was original hydraulic model obtained from FEMA library? (For instructions on how to order study data from the FEMA Library, see http://www.fema.gov/plan/prevent/fhm/st_order.shtm)

☐ Yes ☐ No

If “No”, Explain: _____

If “No”, what is source of information? _____

When analyzing the effects of a project where a detailed Flood Insurance Study (FIS) exists, the following series of hydraulic models should normally be performed in the specified order to create a “base” condition. Please check that these runs were done in the order listed:

Step #1) ☐ Original hydraulic model as received from FEMA.

Step #2) ☐ Original hydraulic model with corrections made.

Step #3) ☐ Corrected model with additional cross-section(s) located at the project site.

Step #4) ☐ Model from Step #3 with the project included.

The model resulting from Step #3 will be the “base” condition and will be used to determine the effects of the project on flood stages (e.g., backwater). (Note: The hydraulic models specified above are the minimum needed to analyze the effects of the project on flood stages when a project is located within the delineated floodway. Additional modeling may be required.)

A summary table should be prepared that shows the relevant water surface elevations (WSEL) at each model cross section for each of the relevant runs/plans: e.g., Effective FIS Base Model, Effective Base with Corrections, Effective Base with Corrections and Additional Cross Sections (Existing Conditions Model), Proposed Conditions Model, etc. The table shown below should be used to document WSELs. If additional cross sections need to be shown or if additional information is needed within the table, please attach a separate table to this document.

Provide (on a disk) files of hydraulic models, including input and output tables. Label all models according to corresponding steps as listed above. Provide a brief hydrology and hydraulics summary report explaining and justifying each of the steps taken to modify the respective models in steps 2 through 4.

Cross section Number or Label	WSEL As Published in the FIS	WSEL Effective FIS Base Model (Step #1)	Δ WSEL FIS - (1)	WSEL Effective Base with Corrections (Step #2)	Δ WSEL (2) - (1)	WSEL Effective Base w/Corrections and Additional Cross Sections (Step #3)	Δ WSEL (3) - (2)	Proposed Conditions Model (Step #4)	Δ WSEL (4) - (3)

Have all of the referenced hydraulic models been submitted on disk or electronically?

☐ Yes ☐ No

After completion of the Above Section, Skip to Section 4 "Flood Protection Method Checklist"

b. If No Detailed FIS Exists for This Stream

Hydrology: Design flood, e.g., 100-yr flood, other

Frequency _____ Discharge _____

Source of discharge information (Check One):

☐ USGS Regional Equations Report 87-4732

☐ USGS Regional Equations Report 00-4233

☐ Corps Study

☐ WRC 17B analysis of Gage Data

☐ Nearby Flood Insurance Study

☐ Other (Explain) _____

Stream Slope: _____ ft. /ft. _____ ft. /mi.

Source (topo map, *survey, other): _____

**(Note: If a surveyed profile is used to determine stream slope, the profile should be of sufficient length (at least 500 feet) to represent the stream slope within the reach.)*

Method of Hydraulic Analysis (Check One):

☐ HEC-RAS/HEC2 (Disk with input/output included? ☐ Yes ☐ No)

☐ Iowa DOT Bridge Backwater (Disk with input/output included? ☐ Yes ☐ No)

☐ Other (list) _____

☐ Rating curve included? ☐ Yes ☐ No

☐ Backwater (surcharge) calculations included? ☐ Yes ☐ No

Mannings "n" Values:

Provide justification for all "n" values used in the model in the space below or within an attached hydraulic summary report:

4. Flood Protection Method Checklist:

Buildings and residential structures must be protected to the appropriate minimum protection level (MPL) by one of the following methods. For example, houses are classified as "high damage potential" and the MPL for houses is the 100-year flood elevation plus 1 foot. There are several methods of meeting the MPL requirement. Please indicate how your building will be protected from flooding and provide all additional information (as indicated by any additional checkboxes) required for the specific flood protection method.

- ☐ **Building Elevated on Fill with a slab on grade type construction.**
- ☐ **Building Elevated on stilts (piers, pilings, etc.).** ** (With area below the elevated building remaining open).

The following must be clearly indicated on the plans:

- ☐ Size and spacing of the stilts (piers, pilings, etc.)
- ☐ **Building with a Basement.** A basement is defined as any fully enclosed area that has its lowest floor below adjacent grades on all sides. A basement must satisfy the following criteria:
- Basement walls and floors below the applicable minimum protection level (MPL) shall be structurally designed and constructed to be watertight to the MPL with walls and floors that are substantially impermeable to the passage of water.
 - All structural components must be able to withstand debris impact forces, and hydrostatic and hydrodynamic forces, including the effects of buoyancy, associated with a water table elevation equivalent to the minimum protection level.
 - All utilities located below the MPL (such as sanitary sewer drains) shall be equipped with automatic closure valves to prevent backflow.

Please note that many communities prohibit construction of basements in the flood plain. You should check with your local building or zoning official prior to having a structural design completed for your basement.

The following must be clearly indicated on the plans:

- ☐ Structural design plans for the basement.
- ☐ Certification by a professional engineer licensed in the State of Iowa that the basement design meets the above listed criteria.
- ☐ **Building that is elevated on an enclosed area below the lowest floor (Minimum Protection Level) that is not a basement (as defined above).** ** The lower enclosed area must satisfy all of the criteria listed below:
- The enclosed area must be designed to equalize hydrostatic pressure during floods by providing a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding. The openings may be equipped with screens, louvers, valves, or other coverings or devices provided they permit the automatic entry and exit of floodwaters. Windows and doors are not considered acceptable openings under this requirement because they require manual operation.
 - The bottom of all openings shall be no higher than one foot above the adjacent grade.
 - The enclosed area must remain unfinished (not carpeted, dry walled, etc.) and used solely for low damage potential uses such as building access, parking or storage.
 - Machinery and service facilities (e.g., hot water heater, furnace, electrical service) contained in the enclosed area must be situated at least one (1) foot above the 100-year flood level.

The following must be clearly indicated on the plans:

- ☐ Number and size of flood vents: _____ Please note that standard windows, service doors and overhead doors do not meet the requirements of flood vents since they require manual operation.
- ☐ Location of the flood vents shown on the floor plan.
- ☐ Total area of flood vents/openings: _____ square inches.
- ☐ Total enclosed area subject to flooding: _____ square feet
- ☐ All utilities (furnace, air conditioner, hot water heater, water softener, non-submersible water pump, electrical services and other utilities) are elevated above

- ☐ the MPL.
- ☐ Sanitary sewer drains below the MPL are provided with automatic closure valves to prevent backflow.

** Please note that the department does not undertake a review of the structural aspects of the stilts, piers, pilings or other extended footing plans. The applicant should have the structural stability of such a plan reviewed by a structural engineer or other qualified individual.

5. Approval Criteria

567—72.5(455B) Buildings. The following criteria apply to buildings.

72.5(1) *Minimum protection levels.* The minimum level of flood protection for a building depends on the damage potential of the building and contents. “Maximum,” “high” and “moderate” damage potential classifications are defined in 567—Chapter 70. Criteria for determining minimum levels of protection are as follows:

- a. Buildings with maximum damage potential shall be protected to the level of a flood equivalent to Q500 plus 1 foot. Determination of the elevation of the department regional flood is recommended as an alternative to establish an appropriate level of protection for a building which has maximum damage potential (see discussion of flood frequencies and magnitudes in 567—subrule 75.2(1)).
- b. Buildings with high damage potential shall be protected to the level of a flood equivalent to Q100 plus 1 foot.
- c. Buildings with moderate damage potential shall be protected to the level of a flood equivalent to Q50.
- d. Buildings adjacent to an impoundment shall be protected to the elevation of the top of the dam unless the dam has adequate spillway capacity to discharge the flood corresponding to the damage potential of the building at an elevation below the top of the dam.
- e. Buildings downstream from a dam shall be protected to a level established by the department after due consideration of the hazards posed by the dam for buildings downstream.

72.5(2) *Flood protection methods.* The following flood protection methods are required for buildings to which a minimum flood protection level applies.

- a. *Structural design and flood proofing.* Basement walls and floors below the applicable minimum flood protection level shall be structurally designed and constructed to be flood proof and able to withstand hydrostatic pressure and buoyant forces associated with a water table elevation equivalent to the minimum flood protection level. However, attached garages and storage space may be constructed below the applicable minimum protection level without flood proofing if all electrical circuit boxes, furnaces, and hot-water heaters are located above the applicable minimum protection level.
- b. *Sanitary sewer drains.* Sanitary sewer drains below the applicable minimum flood protection level shall be provided with automatic closure valves to prevent backflow.

72.5(3) *Location.* The criteria for location of a building include consideration of the potential for obstructing flood flows and the potential hazards which may arise when the building is surrounded by floodwater. Criteria for location of buildings in floodways and flood plains are as follows:

- a. *Obstruction.* Buildings shall not be located in the floodway of a stream so as to result, individually or collectively, in any increase in the elevation of Q100 as confined to the floodway. The floodway boundary applicable to an individual application shall be determined as necessary by the department in accordance with the criteria in rule 567—75.4(455B). Analysis of the effect that a building in the floodway would have on flood levels shall be based on the assumption that all similarly situated landowners would be allowed an equal degree of development in the floodway.
- b. *Public damages.* Buildings shall be located to minimize public damages associated with isolation due to flooding of surrounding ground. In identifying the potential for public damages, the department shall determine whether there is a need for access passable by wheeled vehicles during Q100. The need for such access shall be determined on the basis of the criteria for evaluating flood warning and response time in 567—subrule 75.2(3). IAC 7/2/08 Environmental Protection[567] Ch 72, p.7

- c. *Existing buildings—replacement and improvements.* In applying the criteria in paragraphs “a” and “b” of this subrule to projects which improve or replace existing lawful buildings the department shall give consideration to the policies for protection of existing development in rule 567—75.6(455B).

In order for an application for a building to be considered complete and to allow the Department to conduct a review of the project, all items listed in the “Application for Approval Checklist for Flood Plain Development: Buildings and Houses” must be submitted to the department.

After a completed application and project plan have been received, the project will be reviewed to assure that it meets all applicable DNR criteria for approval, as listed in the “Applying for Approval- Commercial, Industrial, or Other Residential Development and Placement of Associated Fill”.

Permits are issued with both general and special conditions. General conditions include, for example, the expiration date of the permit and the requirement for the applicant to secure all other necessary permits, obtain all lands, easements and rights-of-way for the project, Special conditions are more specific and include requiring the building to be constructed at a minimum elevation (the minimum protection level or MPL), requiring an elevation certificate upon completion of construction, prohibiting some or all of a structure from being finished and restricting the use of all or portions of a building.

Does the Project Satisfy All Criteria? ☐ Yes ☐ No

If No, provide explanation: